

Characteristics of RAM sample data

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Stream Ecologist

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RAM Program

- 1994 - 2011
- Warm-water wadeable streams
- Statewide random sample
- EDU random sample
- Plains random sample
- Priority watershed sites
- Reference sites
- Targeted sites
- Project sites



RAM Program

- **Fish community**
 - IBI
- **Macroinvertebrate community**
 - MSCI
- **Physical habitat**
 - HI
- **Water Quality**



How far upstream does aquatic life occur?

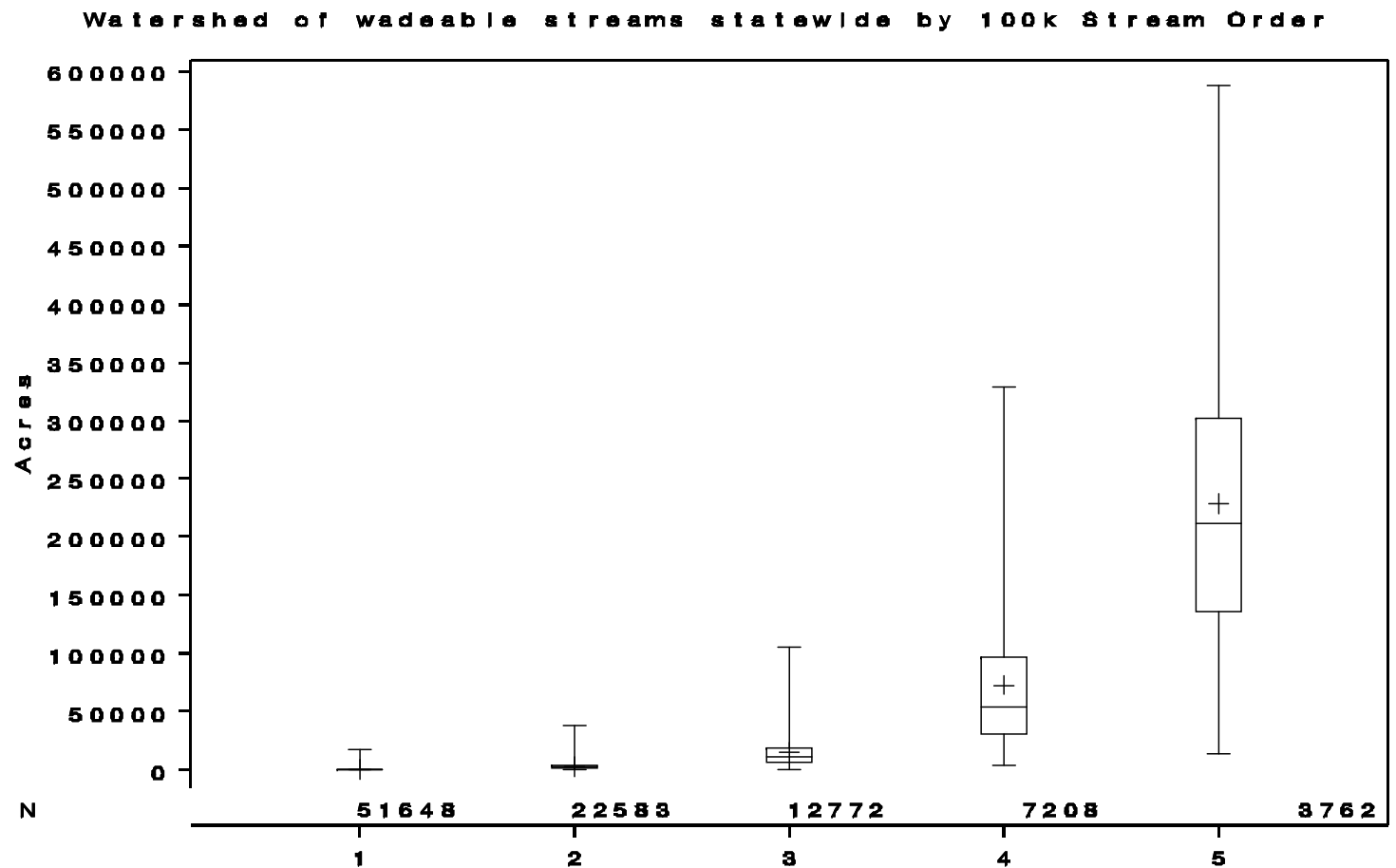
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What does upstream mean?

- Position in network? 1:100,000 or 1:24,000?
 - Strahler stream order
 - Shreve link



What kind of stream should aquatic life protection extend to?

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What does stream mean?

- Flow pattern?
 - Ephemeral flow
 - Intermittant flow
 - Permanent flow

Attributed in the MORAP 1:100k VST

Variable	Inter_N	Perm_N	Inter_Mean	Perm_Mean	Inter_MAX	Perm_Max
Stream Order	148	1017	1	3	4	6
Watershed Area Acres	148	1017	4076	45354	142721	1592980
Macroinvertebrate Taxa Richness	64	430	42	68	102	123
Number of Native Fish Individuals	111	929	291	670	1776	5019
Number of Native Fish Species	111	929	9	18	28	40

- Or did you mean wetness pattern?
 - Vernal pools
 - Ephemeral pools
 - Intermittant pools
 - Permanent pools
 - Drought



Flow and wetness vary

143 acres



Same Site, Different Day

2007

4 fish species



2008

8 fish species



What size of stream supports aquatic life?

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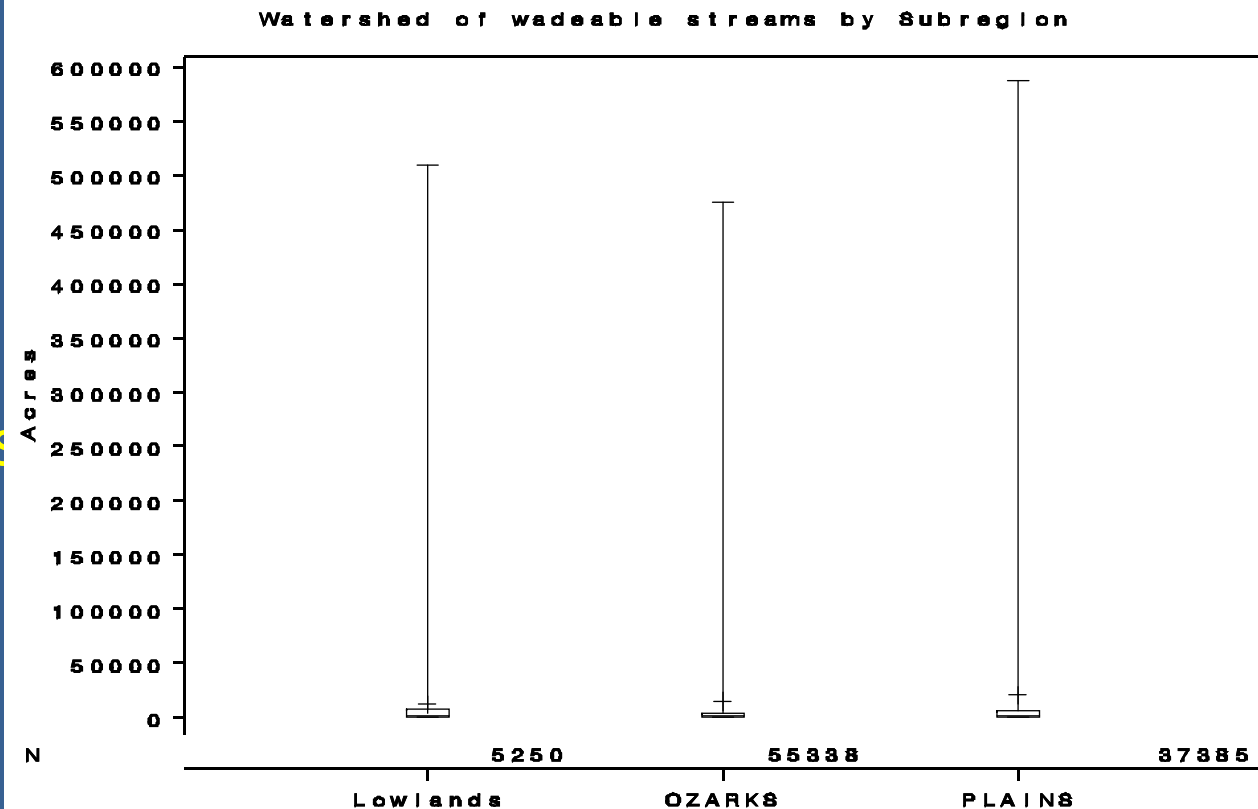
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What does size mean?

Watershed size?

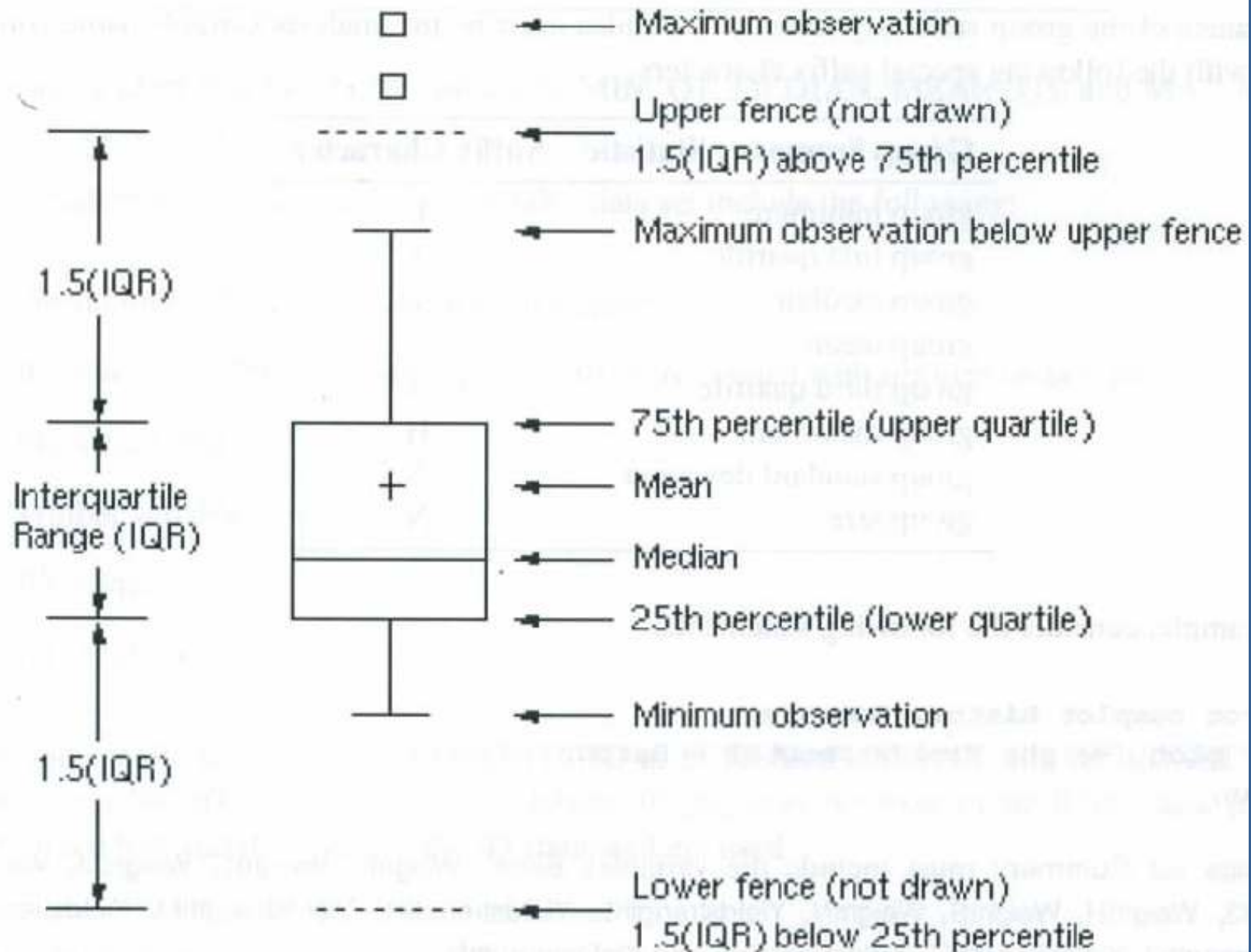
- Regional differences
 - Plains
 - Ozarks
 - Lowlands
- Springs
- Losing streams



What does aquatic life mean?

- Algae
- Vascular plants
- Microinvertebrates
- Macroinvertebrates
 - Snails
- Mussels
 - Fingernail clams
- Fishes
- Amphibians
- Water snakes
- Water birds

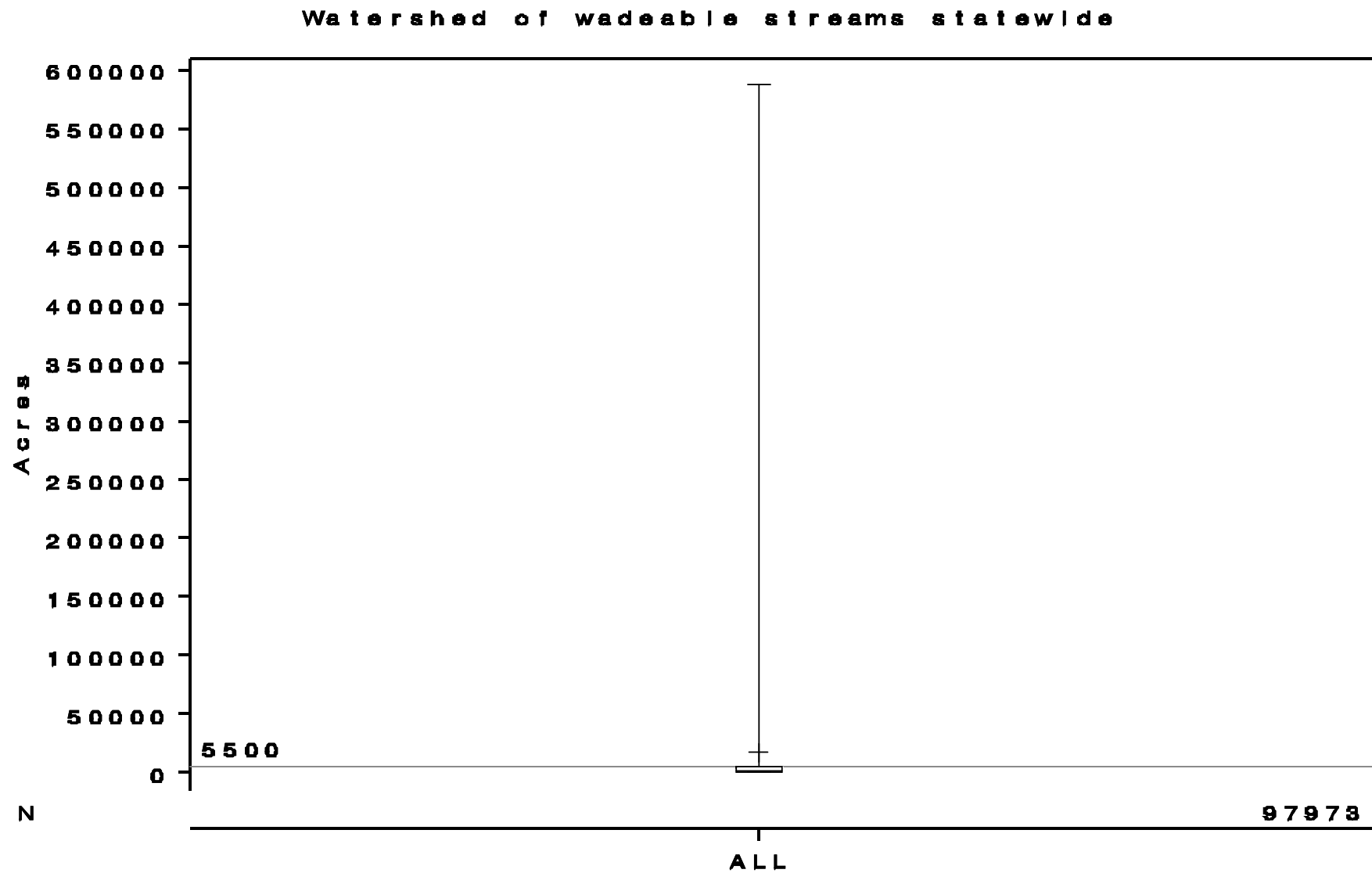
Boxplots.



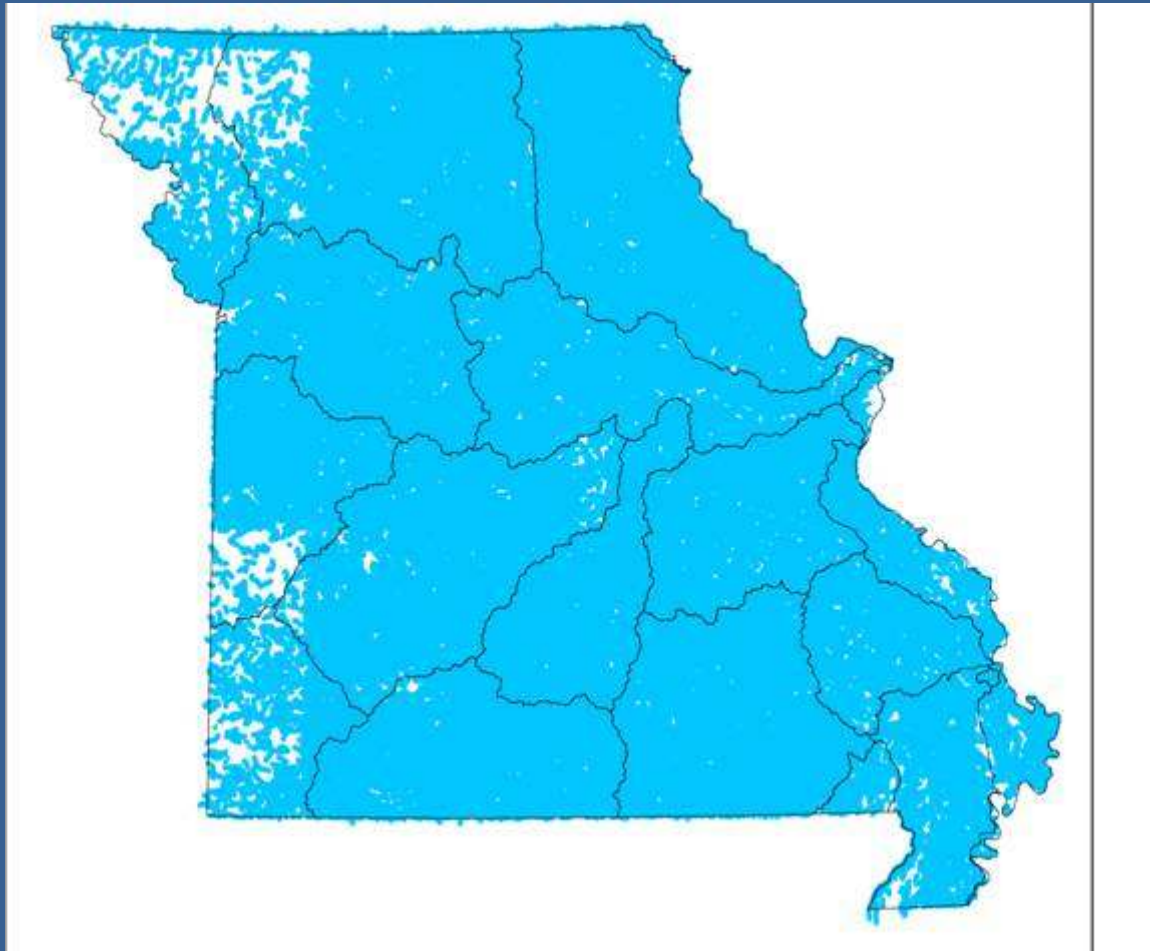
1:100k Stream Segments (106,000)



Size

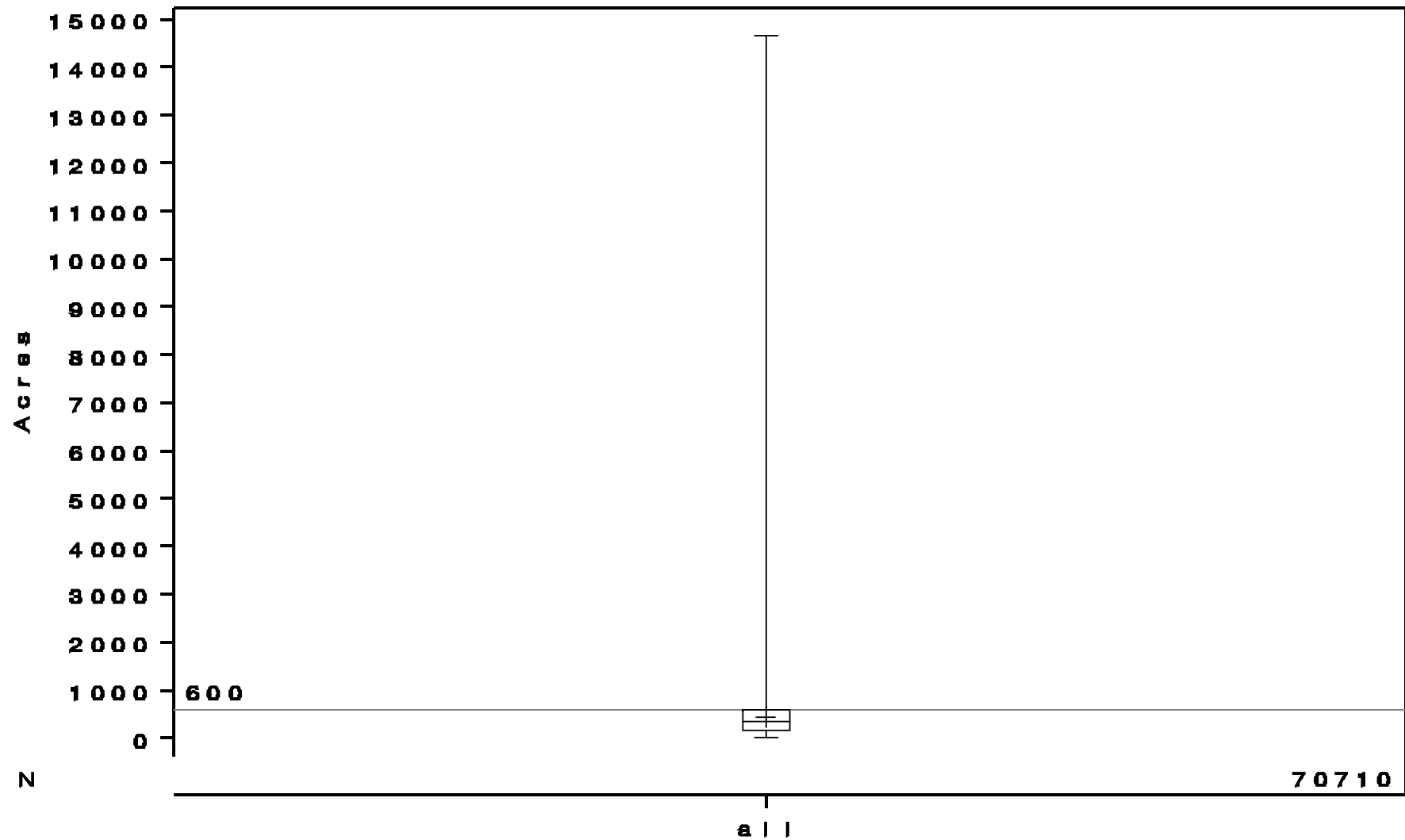


1:100k Unclassified Stream Segments (71,000)



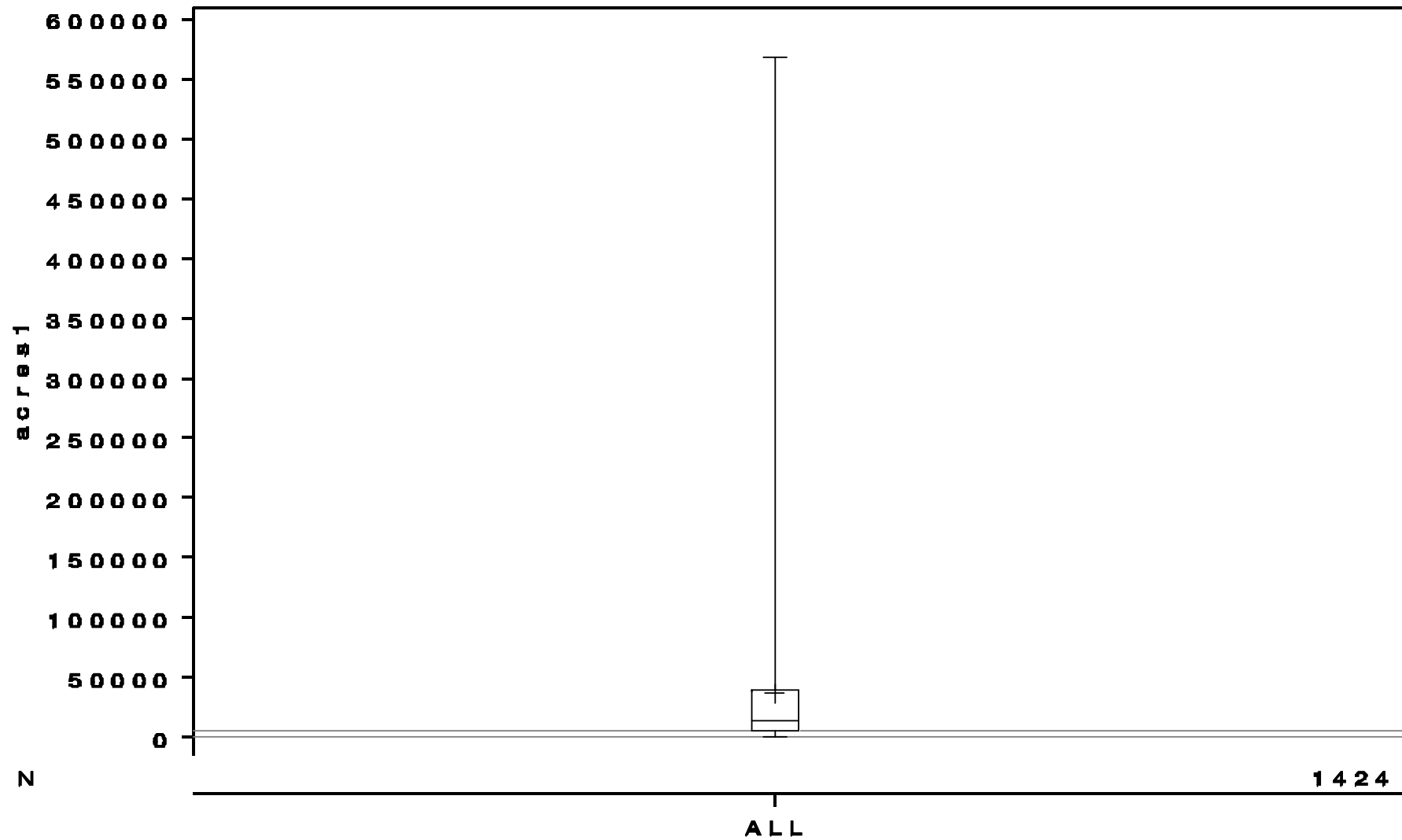
Size

Watershed of unclassified streams statewide

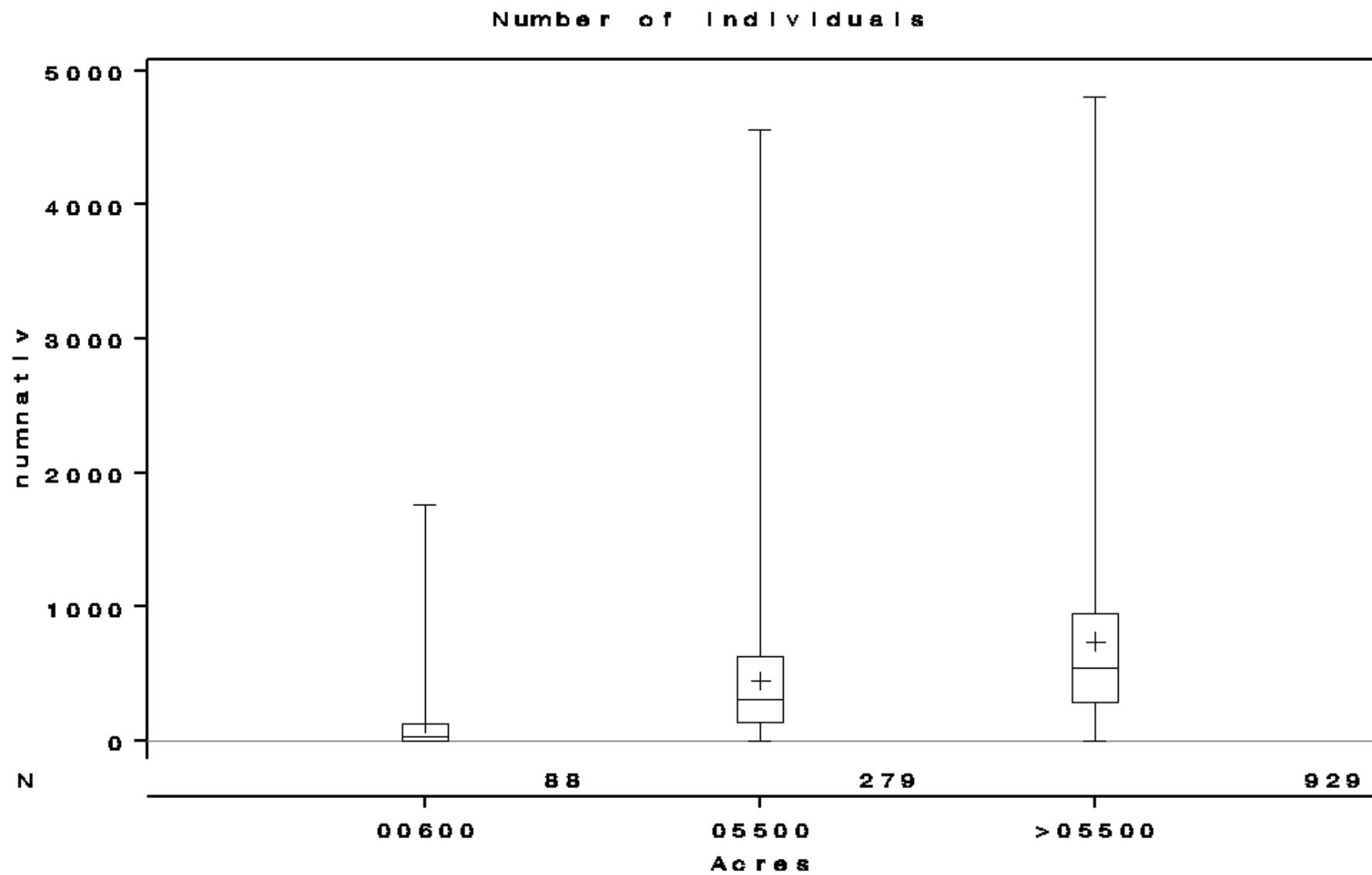


Size

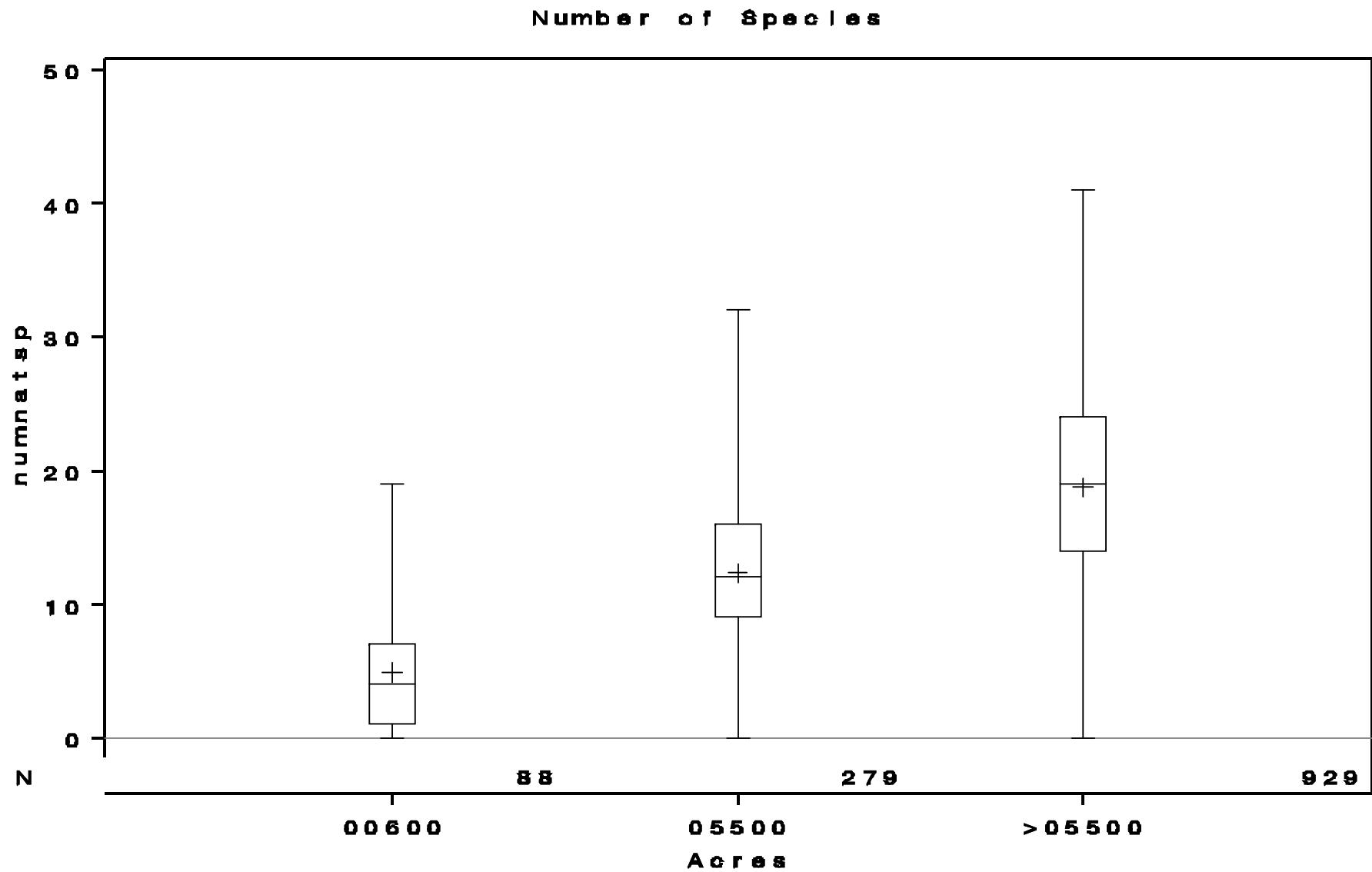
Watershed of sampled sites statewide



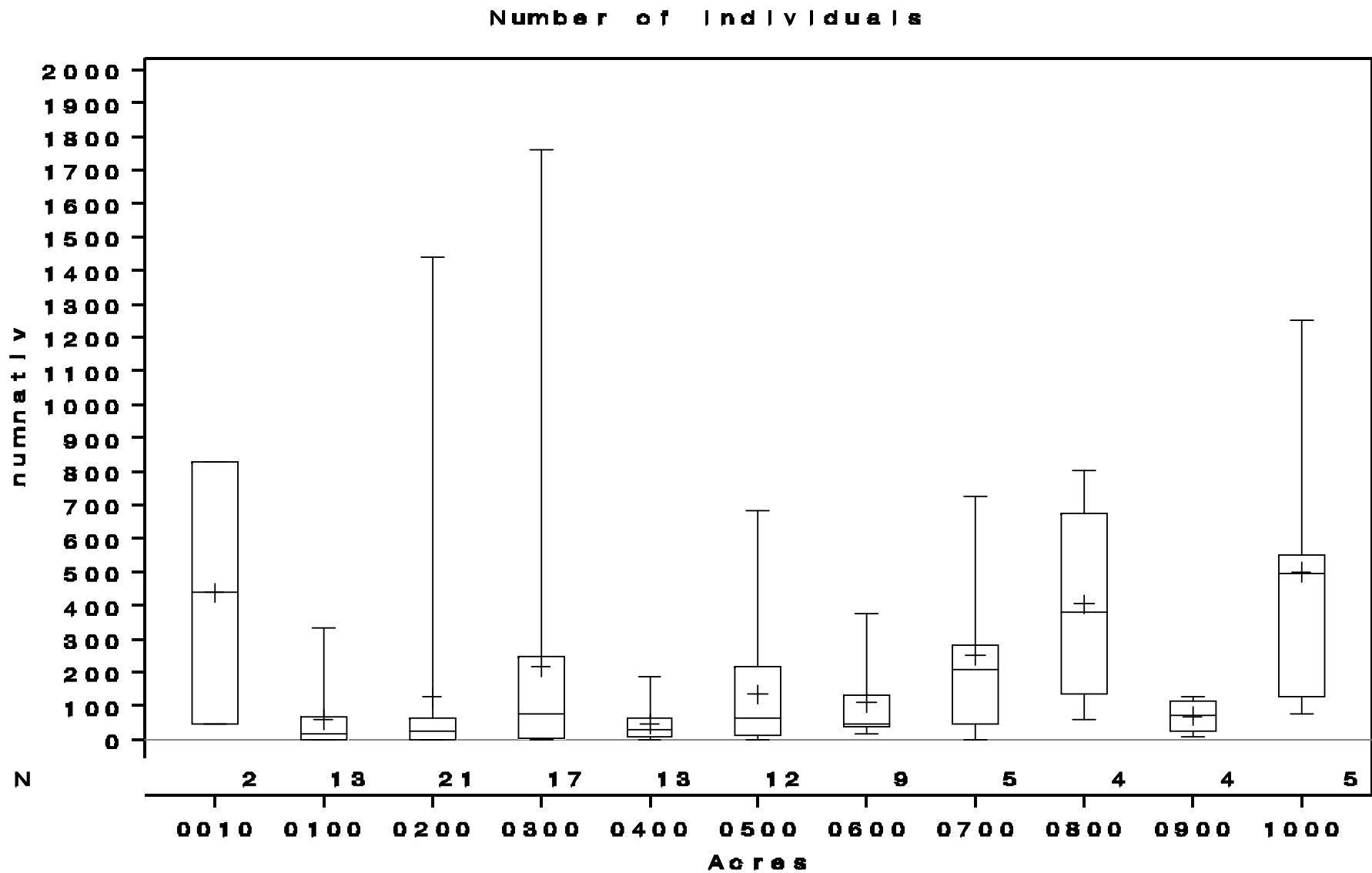
Fish



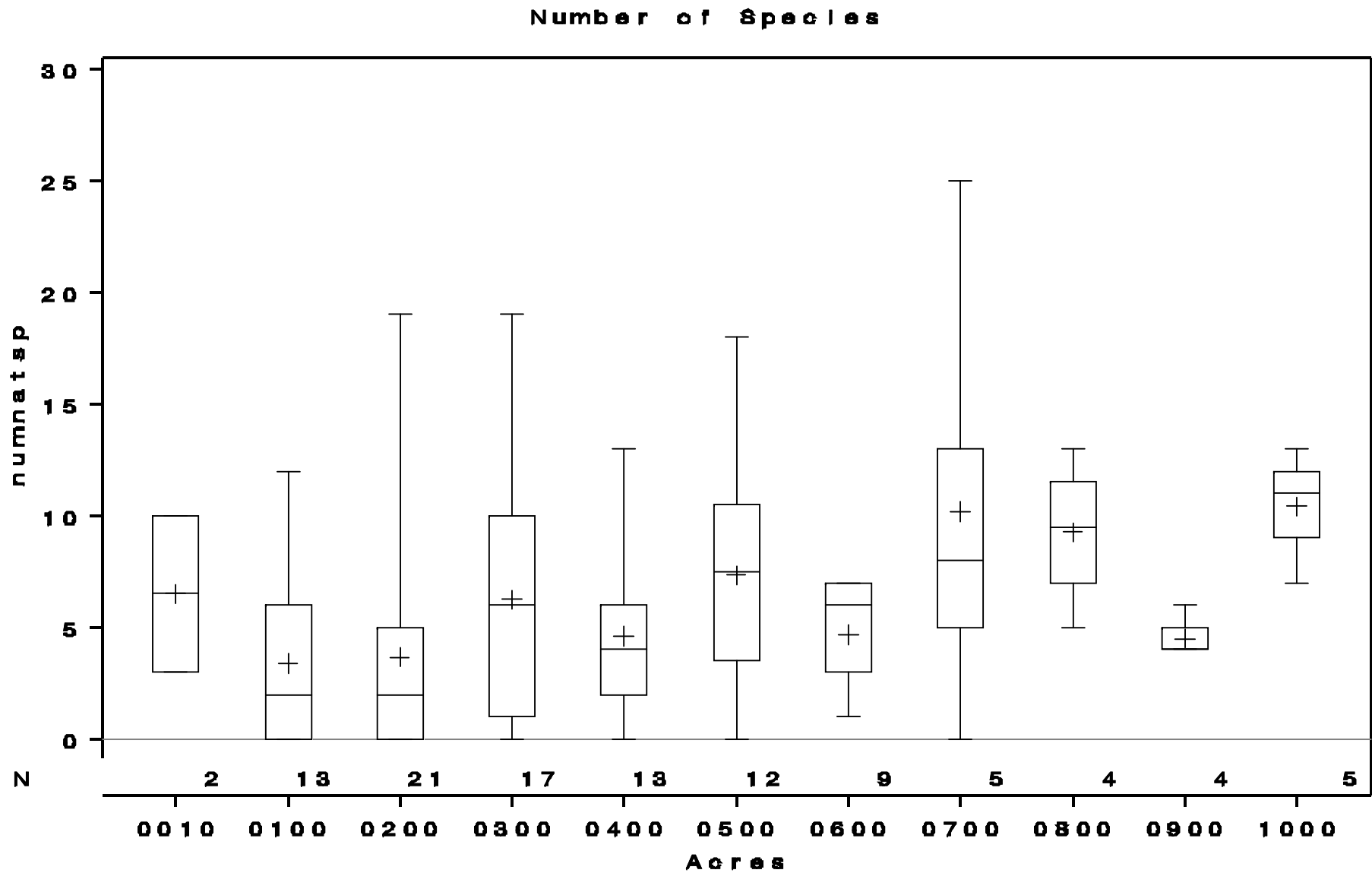
Fish



Fish



Fish





1 km² (260 acres) watershed

7 Fish Species

0.5 km² (120 acres) watershed

3 Fish Species

Conclusions

Streams with intermittent flow have fish communities sometimes

Streams that are characteristic of the presently unclassified portion of the 1:100k NHD have fish communities more often than not

Streams with watersheds as small as 10 acres have fish communities sometimes